MULTIMEDIA UNIVERSITY

STUDENT IDENTIFICATION NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2016/2017

TSM2691 NETWORK SYSTEM FOR MULTIMEDIA

(All Sections / Groups)

18th OCTOBER 2016
2:30 p.m. – 4:30 p.m.
(2 Hours)

INSTRUCTION TO STUDENTS

1. This paper consists of 3 pages with **SIX (6)** questions only.
2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please write all your answers in the answer booklet provided.

QUESTION 1

a) Describe the difference between a *Repeater* and a *Router*. (3 marks)

b) Multimedia is an integration of text, graphics, still and moving images, animation, sounds, and any other medium where every type of information can be represented, stored, transmitted and processed digitally.

Describe *non-linear* and *linear* multimedia. Provide an example each for *non-linear* and *linear* multimedia. (4 marks)

c) Using text in multimedia includes symbols and icons. Describe what an *icon* is and illustrate an example of an icon. (3 marks)

QUESTION 2

a) There are many file formats used to display images on the WWW. Describe which file format would you prefer for Web-based files and justify your answer. (4 marks)

b) Amplitude of a sound is usually stated in *decibels* (dB) rather than in *Pascal* (Pa).

Describe *decibel*. (2 marks)

c) The characteristics of the video are defined in terms of the video's *frame rate*, *frame size*, and *colour resolution*. Describe the downside of reducing any of the TWO (2) characteristics to reduce the video file size. (4 marks)

QUESTION 3

a) One of the principles of compressing multimedia is to use the media's characteristics. Describe TWO (2) media types and their compression used. (4 marks)

b) Web caching is useful and usually implemented by ISP at universities or large companies, list TWO (2) benefits of web caching. (2 marks)

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c) An important aspect of classification of temporal relationships is media synchronization. Describe the *synchronous* temporal relationship and provide an example. (4 marks)

QUESTION 4

a) Show the calculation steps needed to determine the number of bits needed to display 1073741824 colours. (2 marks)

b) Show the steps to calculate the display resolution of a 24 bit colour image that requires 6,220,800 bytes of storage.
(*Note: Display resolution must be in terms of width x height*) (5 marks)

c) Find the bitrate and file size for an audio file that is CD quality and runs for 2 minutes. (3 marks)

QUESTION 5

a) Given an image with a resolution of 4920 x 3264, determine the image print size if the image is to be printed at 300 DPI. (2 marks)

b) Calculate the size of the video given that the total number of pixels is 480000, 8-bit colour output per colour channel, 60 frames per second frame rate, and 30 seconds video length. (2 marks)

c) Given the following table, construct the *Huffman tree* and state the encoding for A, B, C, and D. (6 marks)

Value	Frequency
A	13
B	11
C	4
D	5

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QUESTION 6

a) Compute the *max-min fair allocation* for a set of four sources with demands 4, 2, 2, 10 when the resource has a capacity of 12. Show all the calculations done in all iterations. (5 marks)

b) In the context of Quality of Service (QoS) being specified by a user at *user perspective layer*, explain THREE (3) different ways a user may specify the desired quality. (3 marks)

c) List TWO (2) methods that can be used to model computer based simulation. (2 marks)

End of Paper